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Roberts

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(54) **SYSTEM AND METHOD FOR DELIVERING MEDIA CONTENT AT PREDETERMINED TIMES**

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(51) **Int. Cl.**

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H04N 21/458	(2011.01)
H04N 21/61	(2011.01)
H04N 21/488	(2011.01)
H04N 21/239	(2011.01)
H04N 21/24	(2011.01)
H04N 21/658	(2011.01)

(52) **U.S. Cl.**

CPC ***H04N 21/458*** (2013.01); ***H04N 21/2393*** (2013.01); ***H04N 21/2407*** (2013.01); ***H04N 21/4882*** (2013.01); ***H04N 21/6125*** (2013.01); ***H04N 21/658*** (2013.01)

(58) **Field of Classification Search**

CPC H04N 21/458; H04N 21/6125; H04N 21/4882; H04N 21/2993; H04N 21/2407; H04N 21/658

See application file for complete search history.

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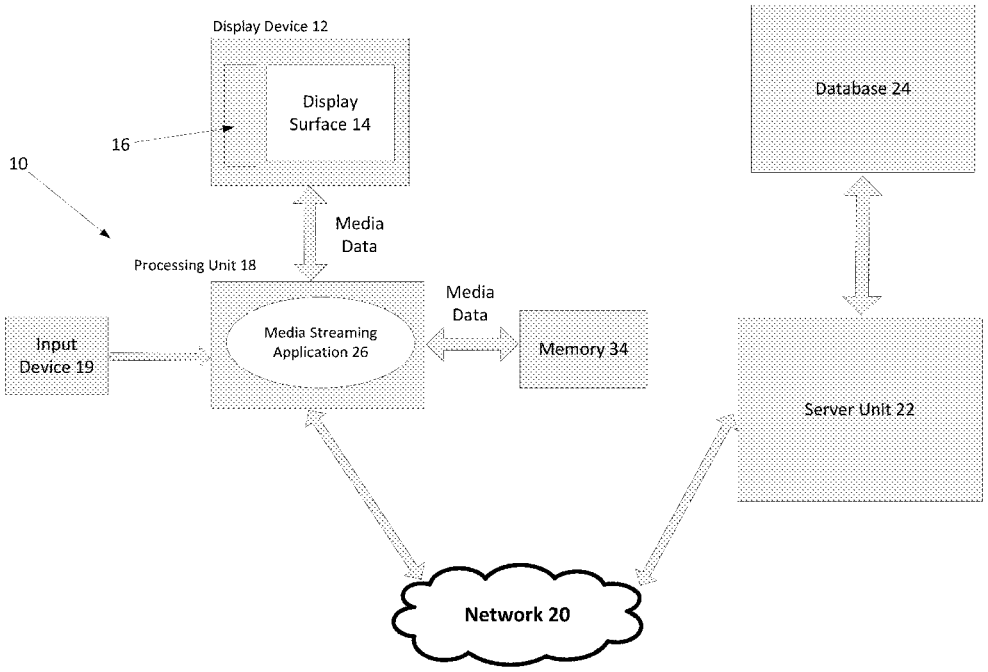
(57) **ABSTRACT**

A method and system for delivering media content to a user at predetermined times. A processing unit of the system receives streamed media content data and causes a display device to display the media content. The method and system include receiving user instructions and streaming media content according to the user instructions.

20 Claims, 9 Drawing Sheets



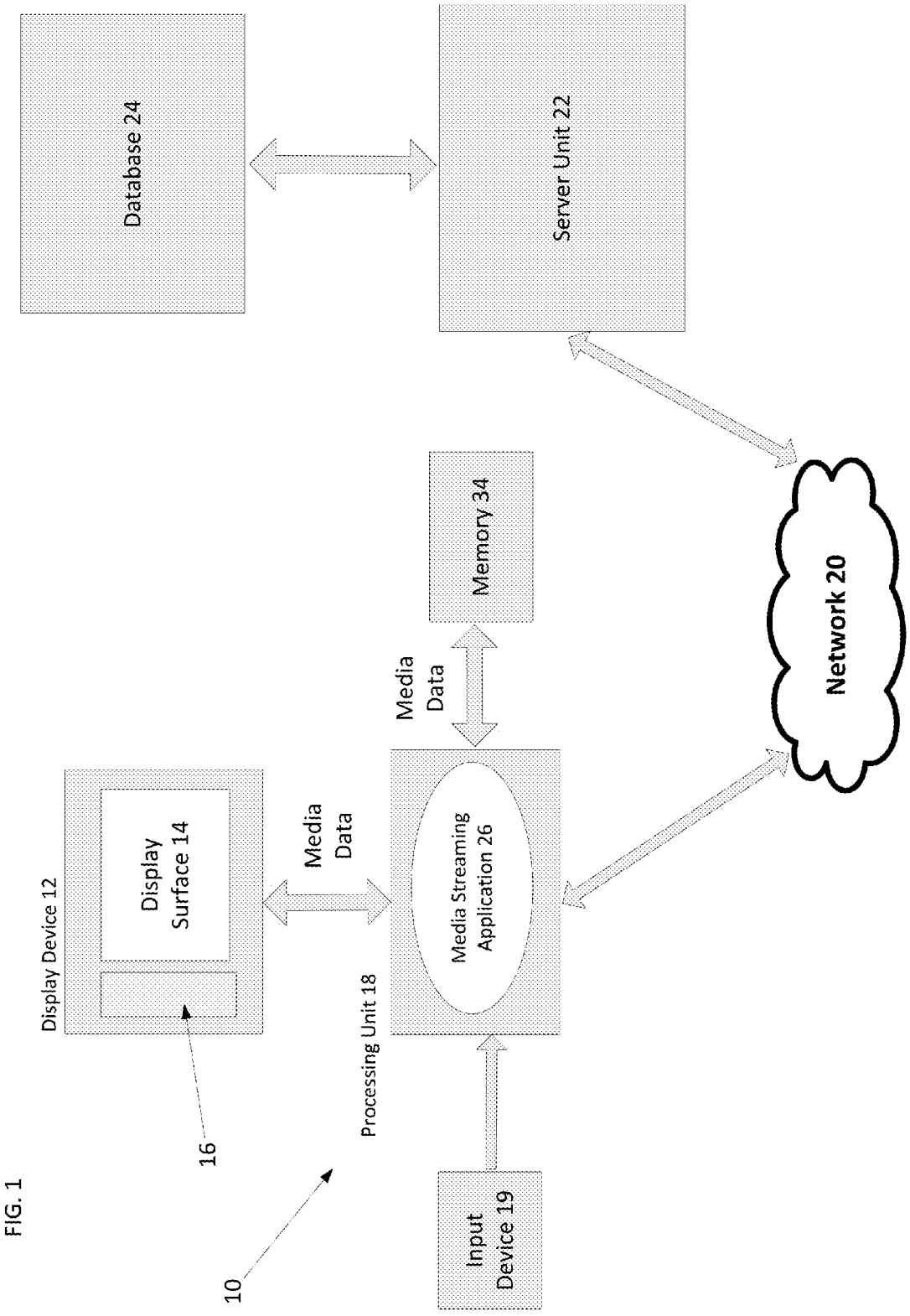

Database 24
Server Unit 22
Memory 34
Media Data
Network 20
Display Device 12
Display Surface 14
Media Data
Media Streaming Application 26
Processing Unit 18
16
10
Input Device 19

FIG. 1

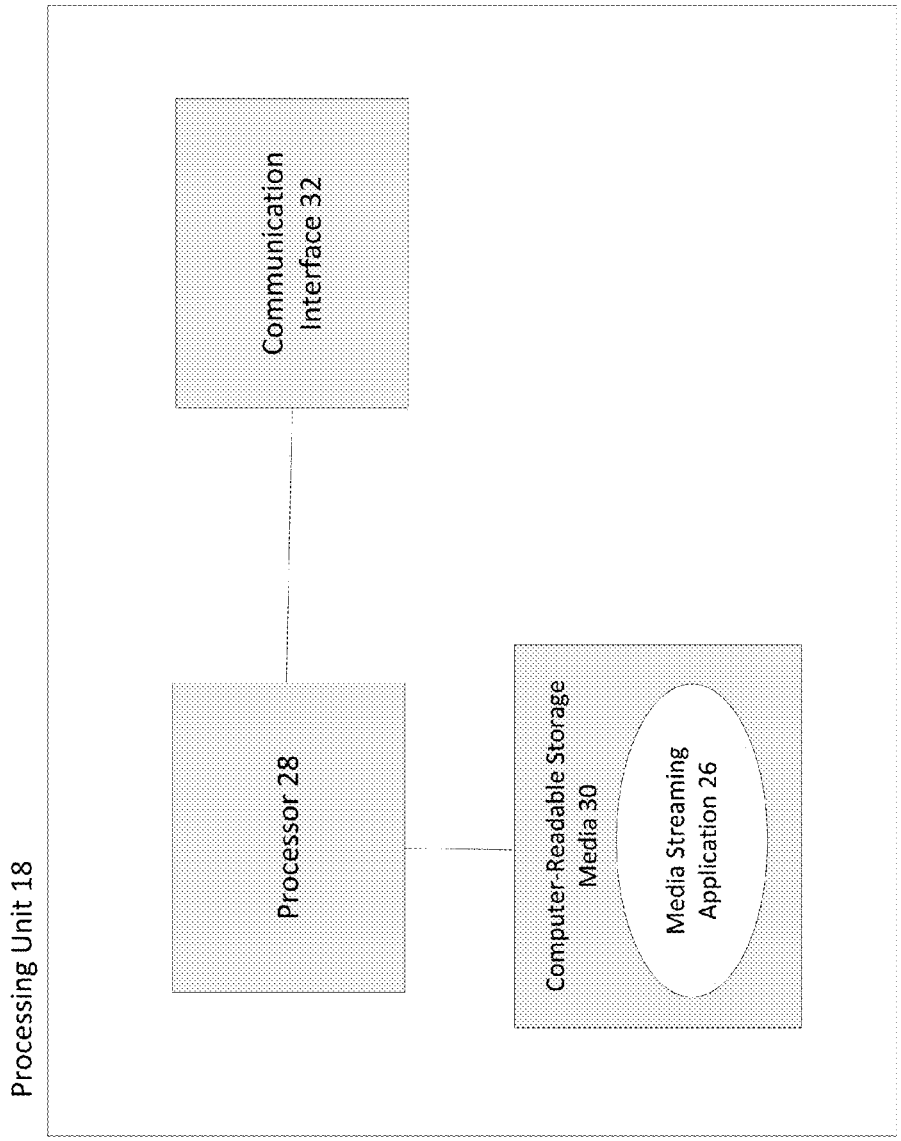

Processing Unit 18
Communication Interface 32
Processor 28
Computer-Readable Storage Media 30
Media Streaming Application 26

FIG. 2

FIG. 3

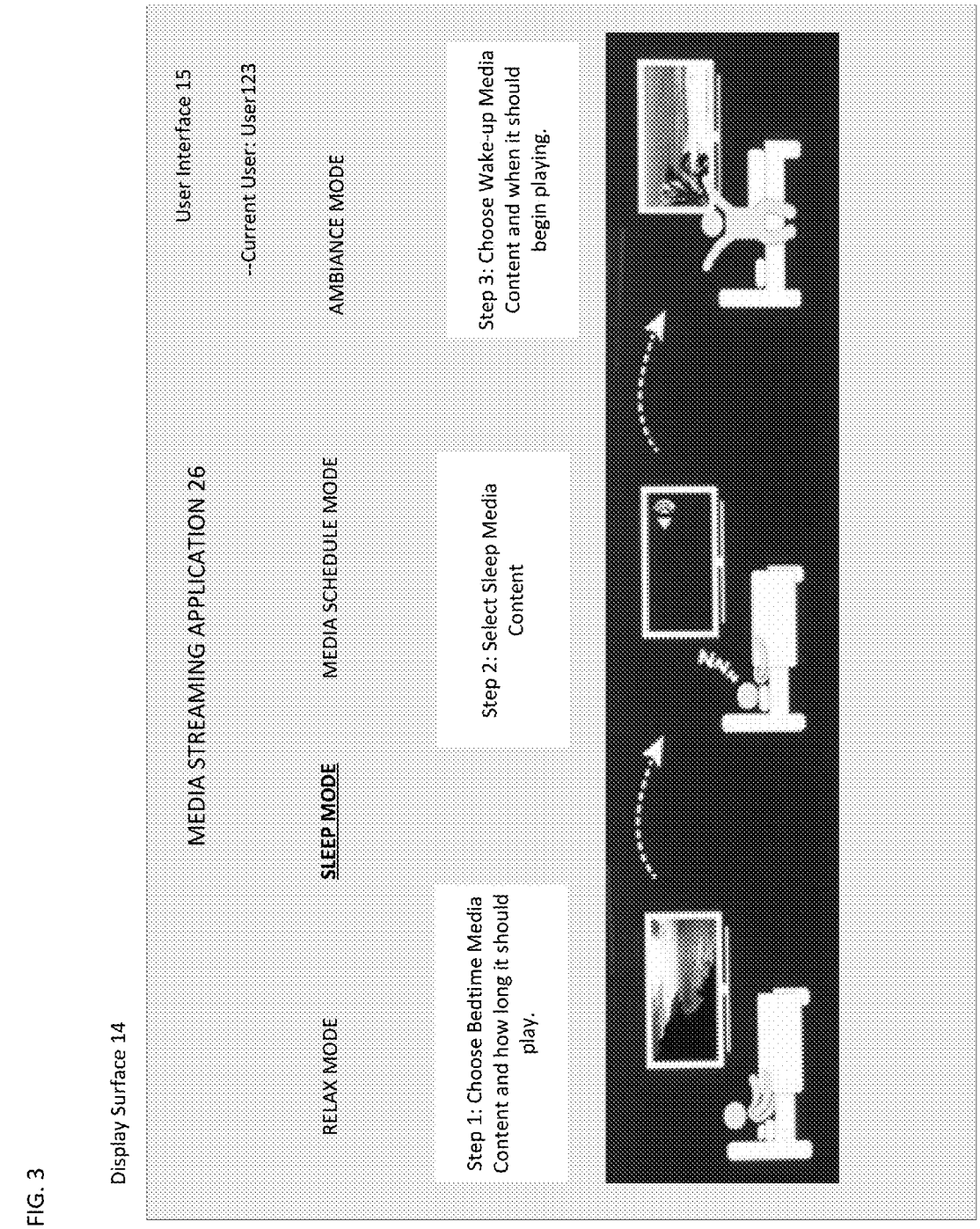

Display Surface 14
User Interface 15
MEDIA STREAMING APPLICATION 26
--Current User: User123
RELAX MODE
SLEEP MODE
MEDIA SCHEDULE MODE
AMBIANCE MODE
Step 1: Choose Bedtime Media Content and how long it should play.
Step 2: Select Sleep Media Content
Step 3: Choose Wake-up Media Content and when it should begin playing.

FIG. 4

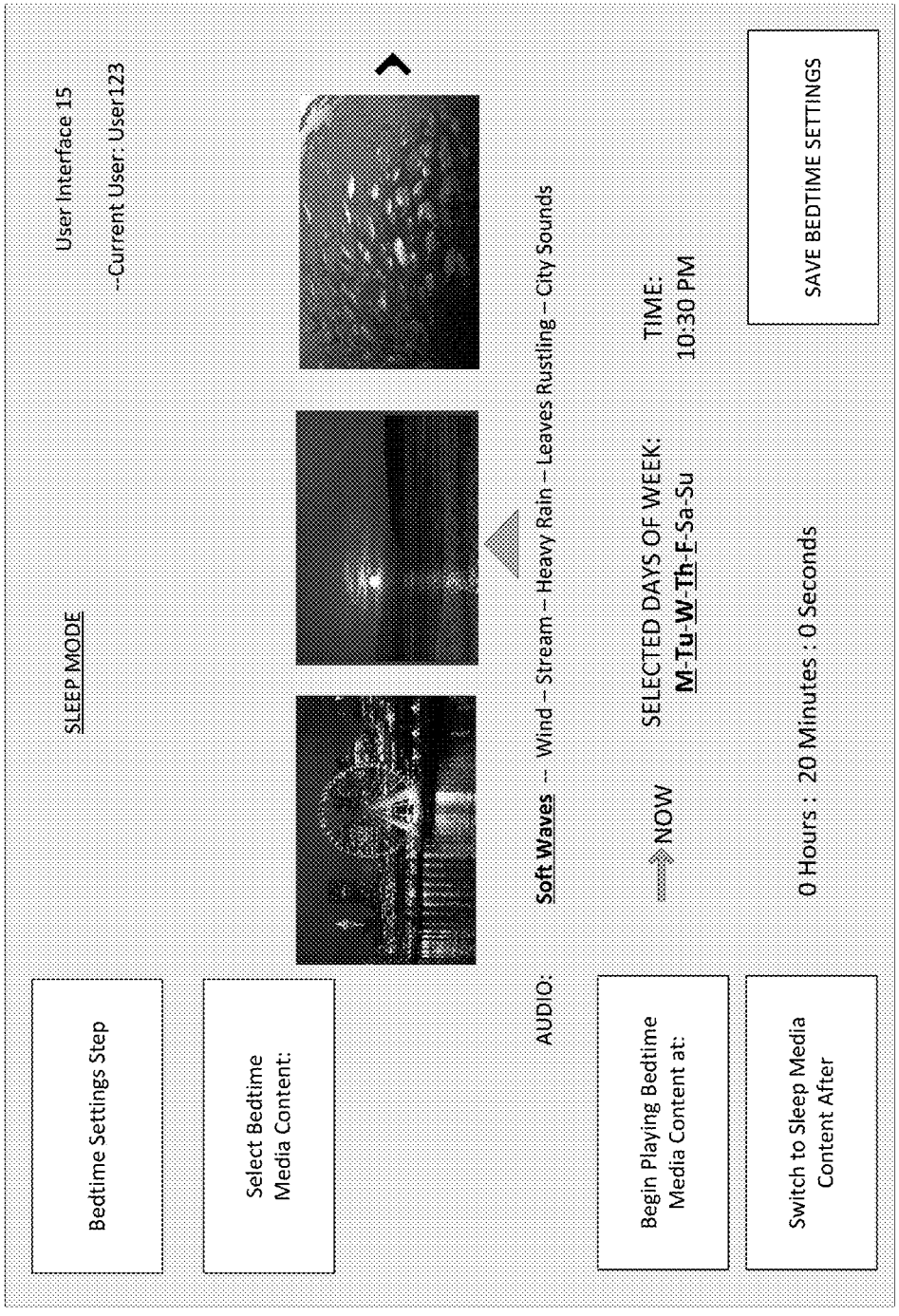

Display Surface 14
User Interface 15
--Current User: User123
SLEEP MODE
Bedtime Settings Step
Select Bedtime Media Content:
AUDIO:
Soft Waves -- Wind – Stream – Heavy Rain – Leaves Rustling – City Sounds
Begin Playing Bedtime Media Content at:
NOW
SELECTED DAYS OF WEEK:
M-Tu-W-Th-F-Sa-Su
TIME:
10:30 PM
Switch to Sleep Media Content After
0 Hours : 20 Minutes : 0 Seconds
SAVE BEDTIME SETTINGS

FIG. 5

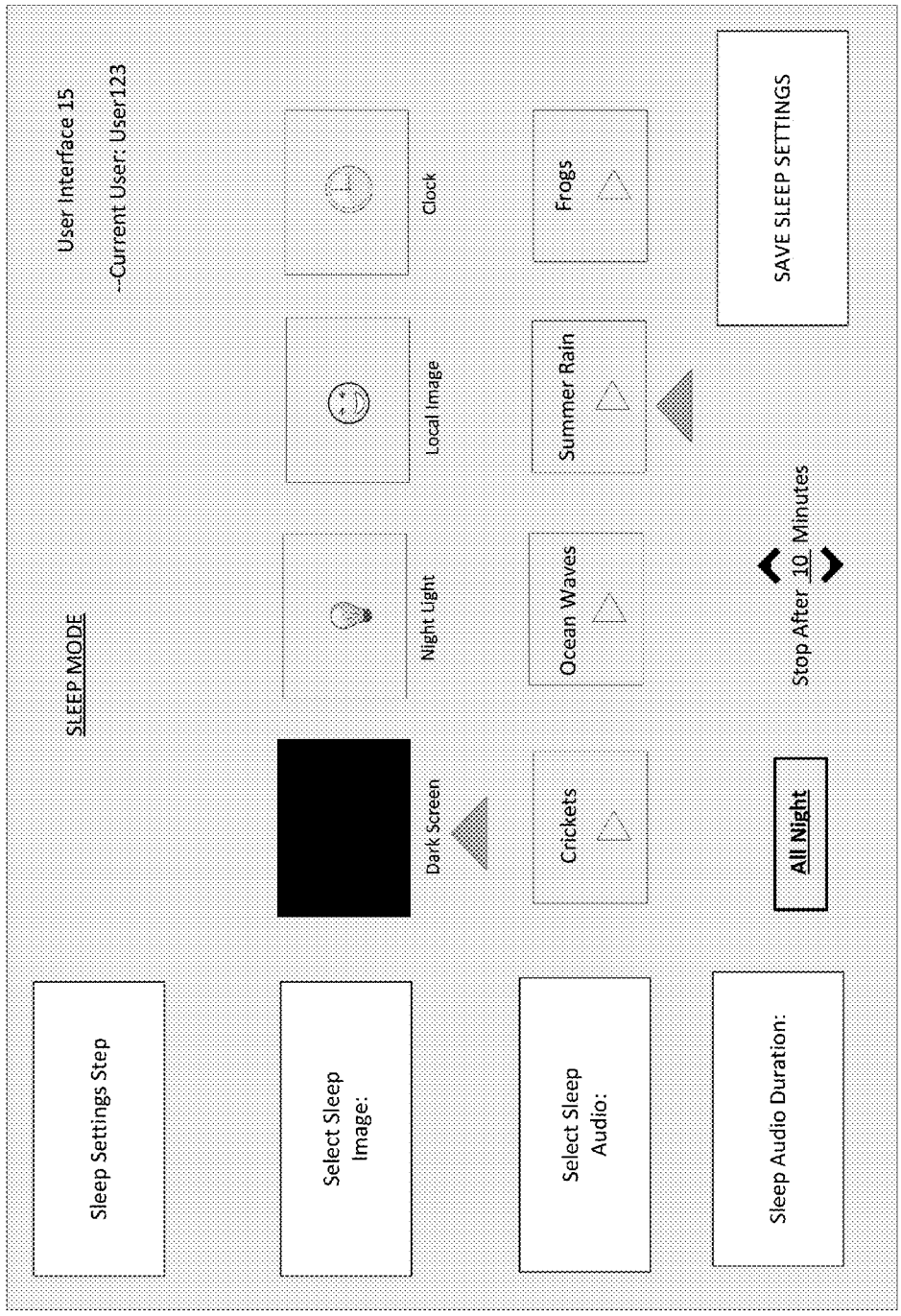
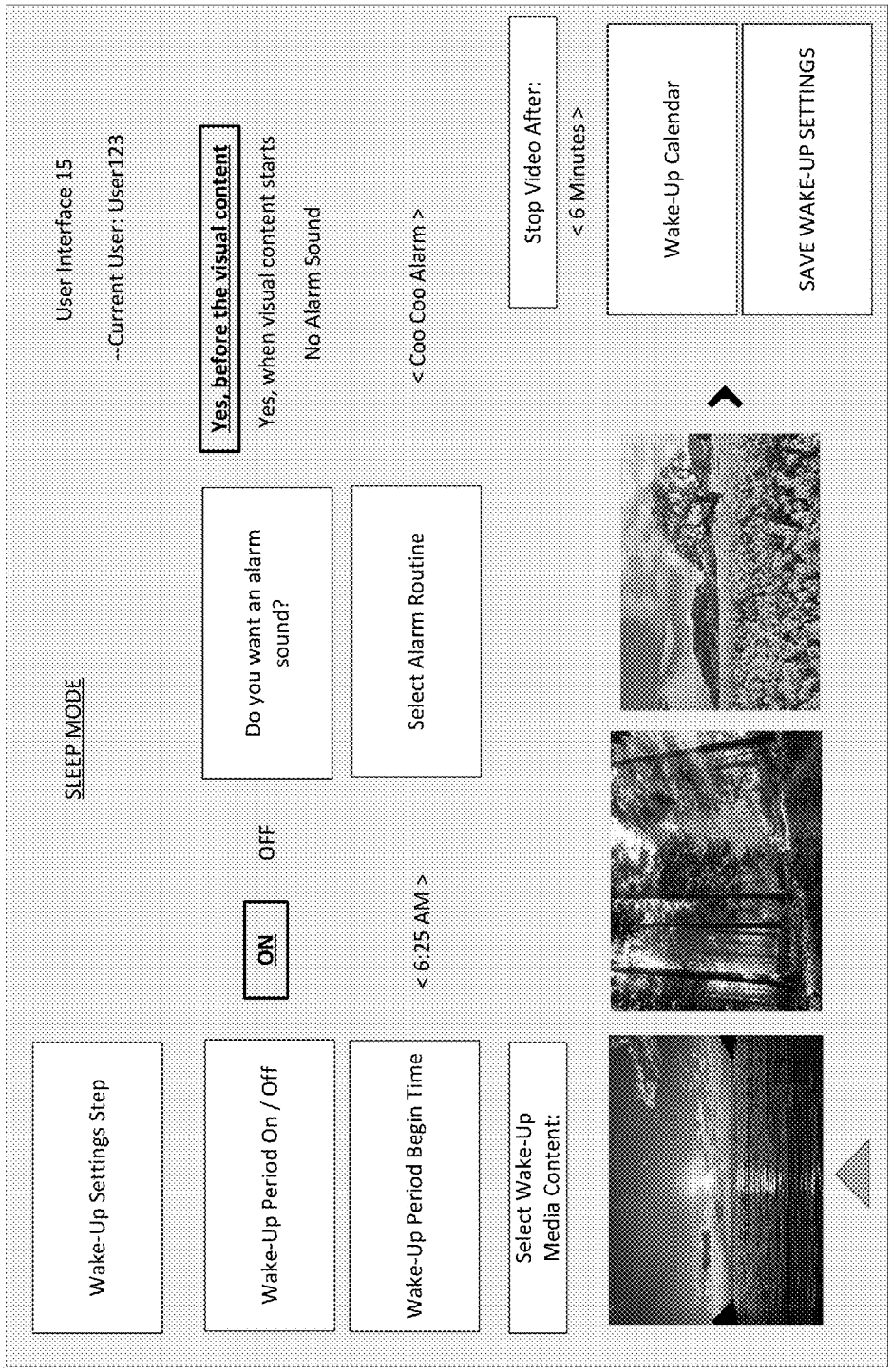

Display Surface 14
User Interface 15
--Current User: User123
SLEEP MODE
Sleep Settings Step
Select Sleep Image:
Dark Screen
Night Light
Local Image
Clock
Select Sleep Audio:
Crickets
Ocean Waves
Summer Rain
Frogs
Sleep Audio Duration:
All Night
Stop After 10 Minutes
SAVE SLEEP SETTINGS

FIG. 6


Display Surface 14
User Interface 15
--Current User: User123
SLEEP MODE
Wake-Up Settings Step
Wake-Up Period On / Off
ON
OFF
Wake-Up Period Begin Time
< 6:25 AM >
Select Wake-Up Media Content:
Do you want an alarm sound?
Yes, before the visual content
Yes, when visual content starts
No Alarm Sound
Select Alarm Routine
< Coo Coo Alarm >
Stop Video After:
< 6 Minutes >
Wake-Up Calendar
SAVE WAKE-UP SETTINGS

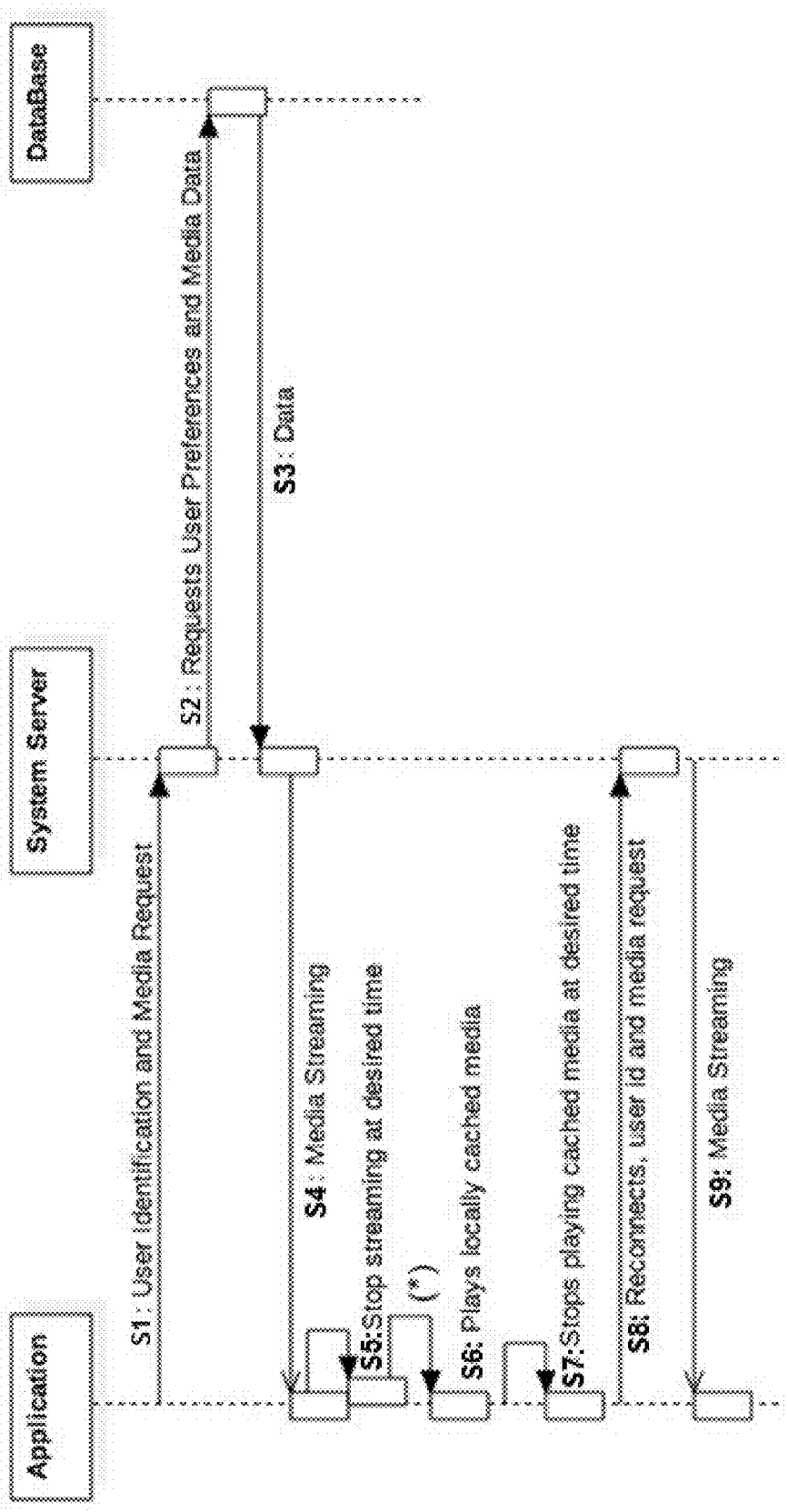

DataBase
System Server
Application
S2 : Requests User Preferences and Media Data
S3 : Data
S1 : User Identification and Media Request
S4 : Media Streaming
S5:Stop streaming at desired time
(*)
S6: Plays locally cached media
S7:Stops playing cached media at desired time
S8: Reconnects, user id and media request
S9: Media Streaming

FIG. 7

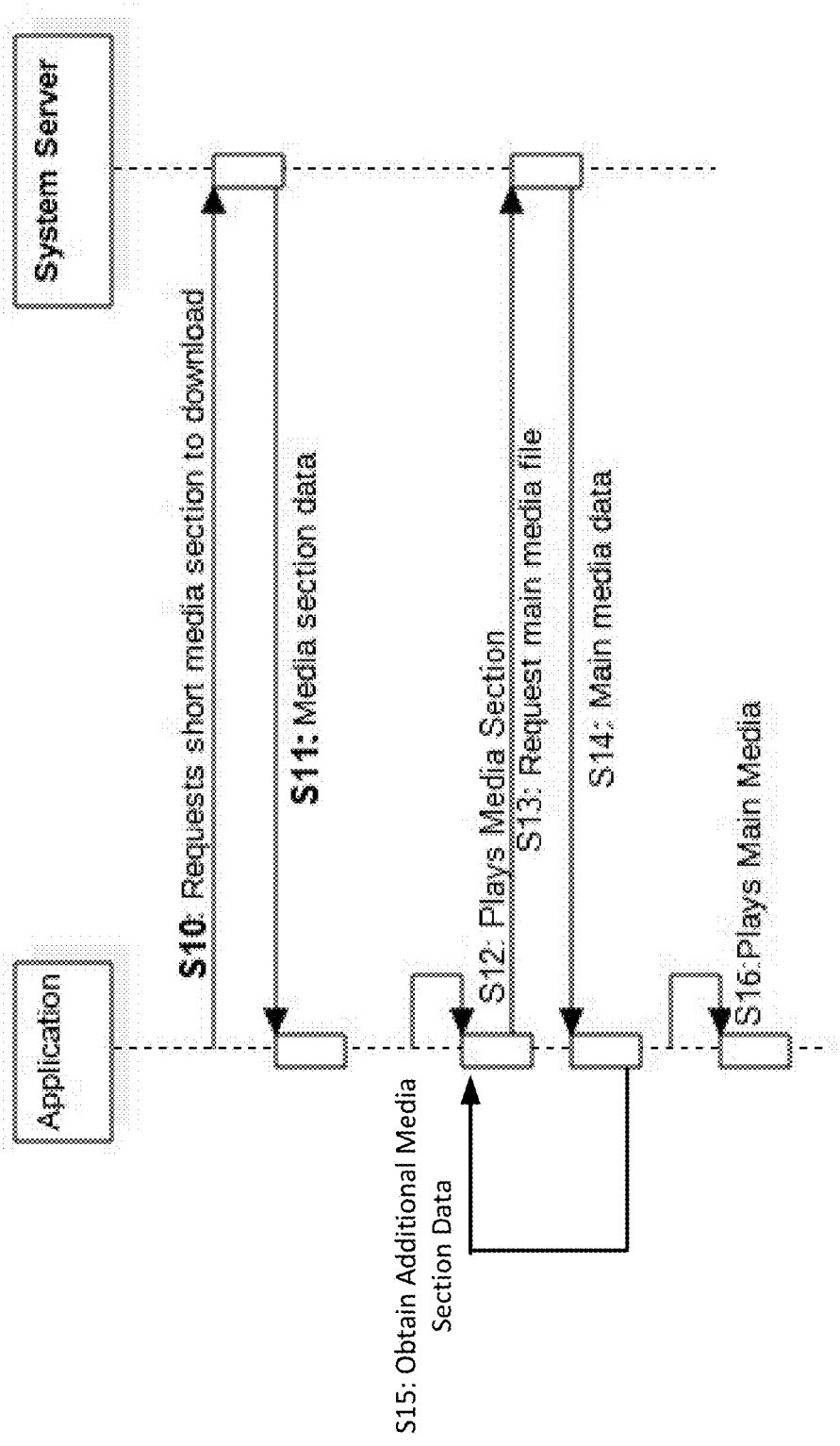
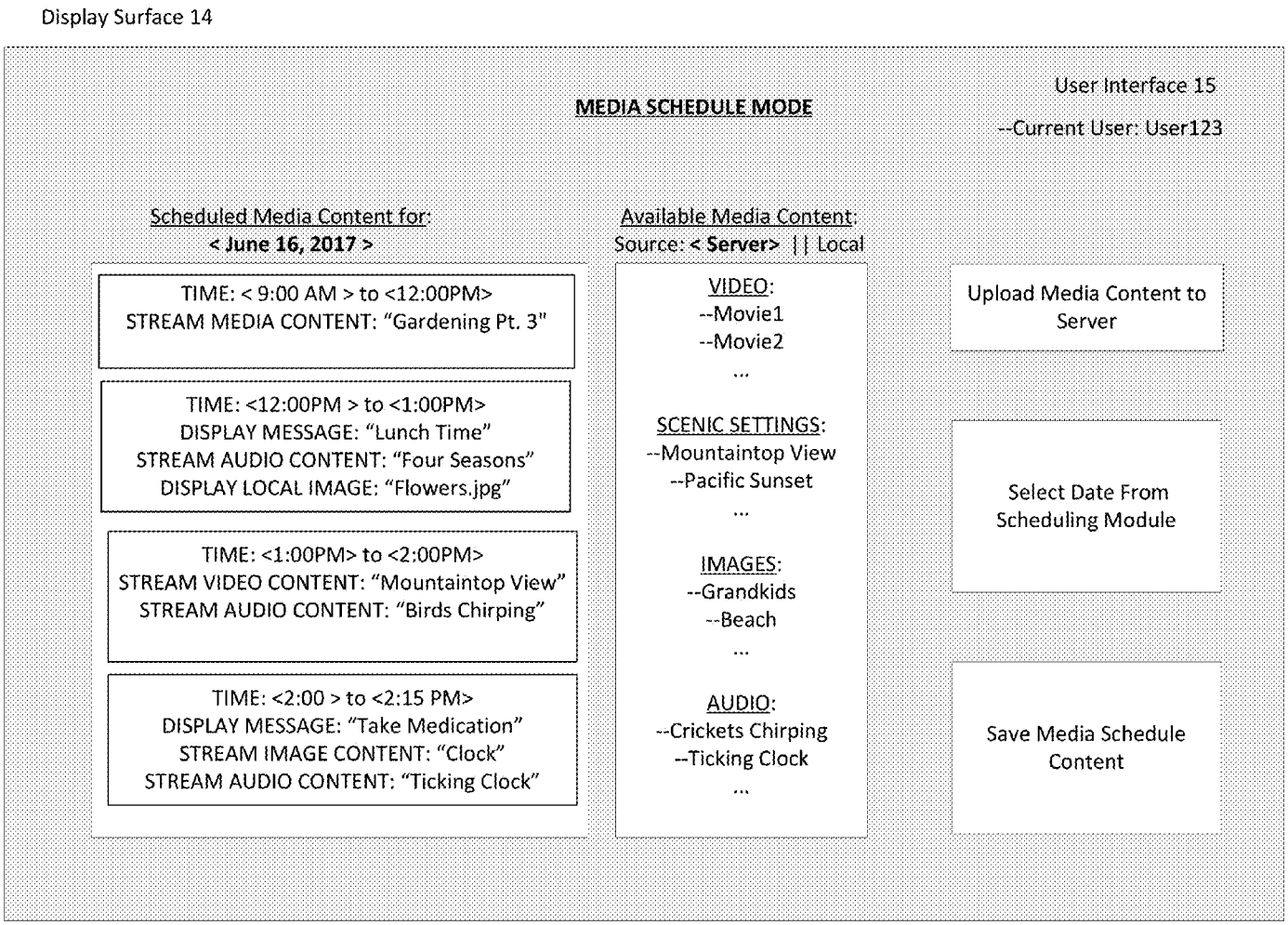

System Server
Application
S10: Requests short media section to download
S11: Media section data
S12: Plays Media Section
S13: Request main media file
S14: Main media data
S15: Obtain Additional Media Section Data
S16: Plays Main Media

FIG. 8

FIG. 9


Display Surface 14
MEDIA SCHEDULE MODE
User Interface 15
--Current User: User123
Scheduled Media Content for:
< June 16, 2017 >
TIME: < 9:00 AM > to <12:00PM>
STREAM MEDIA CONTENT: "Gardening Pt. 3"
TIME: <12:00PM > to <1:00PM>
DISPLAY MESSAGE: "Lunch Time"
STREAM AUDIO CONTENT: "Four Seasons"
DISPLAY LOCAL IMAGE: "Flowers.jpg"
TIME: <1:00PM> to <2:00PM>
STREAM VIDEO CONTENT: "Mountaintop View"
STREAM AUDIO CONTENT: "Birds Chirping"
TIME: <2:00 > to <2:15 PM>
DISPLAY MESSAGE: "Take Medication"
STREAM IMAGE CONTENT: "Clock"
STREAM AUDIO CONTENT: "Ticking Clock"
Available Media Content:
Source: < Server> || Local
VIDEO:
--Movie1
--Movie2
...
SCENIC SETTINGS:
--Mountaintop View
--Pacific Sunset
...
IMAGES:
--Grandkids
--Beach
...
AUDIO:
--Crickets Chirping
--Ticking Clock
...
Upload Media Content to Server
Select Date From Scheduling Module
Save Media Schedule Content

SYSTEM AND METHOD FOR DELIVERING MEDIA CONTENT AT PREDETERMINED TIMES

CROSS-REFERENCE

The current application claims priority to U.S. Provisional Patent Application No. 62/092,523, filed Dec. 16, 2014, the entirety of which is hereby incorporated by reference.

FIELD OF INVENTION

The current invention generally relates to systems and methods for delivering media content at predetermined times.

BACKGROUND

Video over IP streaming applications, streaming platforms, mobile devices, and display devices fail to facilitate a full night of sleep or to leverage the potential of a display device as an alarm clock. Currently available systems, devices, and methods do not allow transition back and forth between locally sourced content to video over IP at a specific time and/or with specific user defined content. Currently screen savers are not conducive to sleeping as they are typically too bright and do not provide a choice of audio. Further, consumers cannot program a media delivery system to resume streaming a specific video over IP on demand at a specific time after a screensaver.

Previously implemented systems fail to overcome the high expense and heavy burden on system resources associated with streaming media content. Temporary memory cache is limited in size and media content may take a long time to download, resulting in lapse or lag in the media content.

In previously implemented systems and methods, users could not customize and preprogram the content that an application will play at a particular date and time. For instance, previous streaming media systems do not allow users to preprogram a wake-up message to play for a child or a parent at a specific date and time (e.g., 8 AM next Friday), or on Thanksgiving or Christmas morning. Previously implemented systems fail to provide a way to superimpose a reminder message (e.g., issuing a medication reminder every day at noon) or request confirmation that the reminder message was received. Previously implemented systems do not allow a user to pre-program or pre-select the media content that will automatically play when an application is opened in a certain scheduled time (e.g., between 8 and 9 am Saturday or Sunday morning). Previously implemented systems do not allow for a user to automate playing a user-customized media content playlist for enhancing a user's sleep.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. **1** illustrates a schematic view of a media delivery system according to a first embodiment.

FIG. **2** illustrates a schematic view of a processing unit of the media delivery system of FIG. **1**.

FIG. **3** illustrates a first view of a user interface displayed on a display device of the media delivery system of FIG. **1**.

FIG. **4** illustrates a second view of the user interface displayed on the display device of the media delivery system of FIG. **1**.

FIG. **5** illustrates a third view of the user interface displayed on the display device of the media delivery system of FIG. **1**.

FIG. **6** illustrates a fourth view of the user interface displayed on the display device of the media delivery system of FIG. **1**.

FIG. **7** illustrates a method of delivering media content.

FIG. **8** illustrates a process of delivering locally cached media content in the method of FIG. **7**.

FIG. **9** illustrates a fifth view of the user interface displayed on the display device of the media delivery system of FIG. **1**.

DETAILED DESCRIPTION

A media delivery system **10** is shown in FIG. **1** according to a present embodiment in which different media content may be delivered to a user at predetermined times. The media delivery system **10** is operable to allow the user to input settings instructing the streaming system to stream first media content at a first selected time, play second media content at a second selected time, then stream a third media content at a third selected time.

The user may input settings that define the first selected time, the second selected time, the third selected time, the first media content, the second media content, and the third media content. At the first selected time, the media delivery system **10** may stop currently playing media on the display device and begin streaming the first media content over the internet to be played on the display device. At the second selected time, the media delivery system **10** will cease streaming the first media content and begin playing the second media content stored in a local memory. The second media content will play on the display device until the third selected time, at which point the delivery system **10** will stop playing the second media content and begin streaming the third media content on the display device.

The media delivery system **10** provides a user-defined atmosphere at specified times and dates, which may facilitate a consistent sleeping environment, by way of the following non-limiting example. The atmosphere may be defined by the user at or before bedtime. During the first time period specified by the user, the media delivery system **10** may provide a peaceful atmosphere for falling asleep, such as a Pacific coast sunset accompanied by the sound of rolling waves. After the first time period, the media delivery system **10** may display a dark screen and generate low-volume cricket noises for the second time period, which is a period of time during which the user is sleeping. At a third time period, the media delivery system **10** prompts the user to wake up by providing video of a sun slowly rising accompanied by peaceful classical music.

The media delivery system **10** may comprise a display device **12**, a processing unit **18**, an input device **19**, a network **20**, a server unit **22**, a database **24**, and a local memory **34**, as shown in FIG. **1**. The display device **12** has a display surface **14** configured to display an image and a sound generation unit **16** configured to produce sound. The display device **12** may be a television, a computer monitor, a mobile phone display screen, or a tablet display screen, by way of non-limiting example. The display device **12** is configured to receive media data comprising video data and/or audio data from the processing unit **18**. The processing unit **18** represents any of computers, smartphones, tablet computers, laptop computers, netbook computers, smart televisions, set-top boxes, or other similar computing devices. In some embodiments, the display device **12** and

the processing unit **18** may be housed in a single unit. In other embodiments, the display device **12** and the processing unit **18** are separate units that form the media delivery system **10**. The processing unit **18** is configured to host or execute a media streaming application **26**, as described below in greater detail.

An implementation of the processing unit **18** that may be used in connection with the embodiments described herein is shown in FIG. **2**. The processing unit **18** may include one or more processors **28** for executing the media streaming application **26**, and one or more computer-readable storage media **30** for storing the media streaming application. The processing unit **18** may include a communication interface **32** for transmitting data to and receiving data from other devices over network **20**. The communication interface **32** is not particularly limited and may include any of a wireless communication transceiver (e.g., Wi-Fi transceiver, RF transceiver, mobile phone transceiver, Li-Fi transceiver, IrDa transceiver, Bluetooth transceiver, satellite transceiver) or a wired communication device (e.g., internet modem, fiber-optic transceiver, telephonic systems, USB). The network **20** may be a wide area network (WAN) facilitating communication between two or more local networks. The processor **28** may comprise any of a computer processing unit (CPU), field-programmable gate array (FPGA), application-specific integrated circuit (ASIC), or similar processing unit. The storage media **30** is a data storage component comprising any of ROM, RAM, EEPROM, or flash memory, by way of non-limiting example. The processor **28** is configured to write and read data to and from the storage media **30** and the memory **34**.

The memory **34** is a non-volatile data storage component for locally storing media data including image data, video data, or audio data, as described below. In some embodiments, the memory **34** is a storage device located on a local area network accessible via the communication interface **32**. Memory **34** is a data storage component that is accessible by the processing unit **18** on a local area network (LAN) or directly available on a local hard drive. In other embodiments, the memory **34** may be a local storage device that is directly attached to the processing unit **18** or that is included in the storage media **30**.

The user may operate the input device **19** to access the media streaming application **26**. As shown in FIG. **3**, a user interface **15** of the application **26** is displayed on the display screen **14** of the display device **12**. The user interface **15** includes a user identity verification process (i.e., user login area) wherein a user may enter user identification information to access, retrieve, and edit personalized application settings on the server unit **22**. The user may select different modes of the application **26** on an interactive menu of the user interface **15**, including a sleep mode, a relax mode, a media schedule mode, or an ambiance mode, by way of non-limiting example. The application **26** may provide a brief operating description of each mode. Operation of the sleep mode is provided as an example of the operation of the application **26** that is illustrative of one aspect of the media delivery system **10** and not intended to limit the scope of its operation.

The user interface **15** shown in FIG. **3** indicates that there are at least three steps for setting up the sleep mode. In a bedtime period settings selection step, the user selects the first media content to play at bedtime and a duration indicating how long the first media content will play or indicating when the first media content will stop. In a sleep period settings selection step, the user selects media content to play while the user is asleep. In a wake-up period settings selection step, the user selects media content to wake the user up in the morning. Once the user selects the desired mode of the application **26** using the input device **19**, the application will guide the user through the process of setting up the desired mode.

During the bedtime settings selection step of a sleep mode setup process, the user interface **15** is operable to allow the user to select a visual media content and/or an audio content to play during a bedtime period, as shown in FIG. **4**. The selection of visual media content available for play during the bedtime period may be video scenes with subtle movement, such as a city at night. The selection of audio media content available may be a sound or combination of sounds that promote the user to fall sleep. The visual media content and the audio content available for selection in the bedtime settings step are stored in the database **24** accessible over the network **20**, as described below. The user may upload his video media content or audio media content to the database **24**, which are made available for selection during the bedtime settings step.

The user may operate the user interface **15** to select when the selected bedtime media content should begin playing. The user interface **15** may allow a user to configure the application **26** to begin playing the bedtime media content on selected days of the week at a certain time, or immediately play the bedtime media content after the sleep mode setup process is completed. The user may also operate the user interface **15** to select a bedtime period duration indicating how long the bedtime media will play for, or designate a time at which the bedtime media content will stop. In some embodiments, the application **26** may be configured to play the bedtime media content according to scheduled dates or times. For example, the user interface **15** may include a calendar which allows the user to designate days on which the application **26** will or will not execute the sleep mode.

Once the user is satisfied with the bedtime settings, the user may save the bedtime settings by selecting the "Save Bedtime Settings" button to move on to the next step. Upon completing the bedtime settings by selecting the "Save Bedtime Settings" button, the media delivery system **10** may save the bedtime settings of the user in the database **24** in association with a user profile.

During the sleep settings selection step of the sleep mode setup process, the user interface **15** is operable to allow a user select an image content and/or audio content played during a sleep period after the bedtime period expires, as shown in FIG. **5**. The image content and the audio content available for selection in the sleep settings step are stored in the local memory **24** or embedded within the application **26**. In some embodiments, the image content or the audio content in the sleep period is locally cached media content that is downloaded after the sleep mode begins, as described below with reference to FIGS. **7** and **8**. The image content may be a dark image, a night light, a clock, or an image stored on a local hard drive or local area network, for example. In some embodiments, the user interface **15** is operable to change various aspects of the sleep image. For example, the user interface **15** may allow the user to adjust the color or the brightness of the nightlight, or the brightness of the local image selected by the user.

The audio content selected to be played during the sleep period may be the same or different than the audio content played during the bedtime media period. The user interface **15** may be configured to adjust aspects of the sleep period audio content, such as duration or volume. The user interface **15** may allow the user to select whether the sleep period audio content plays the entire sleep period (i.e., all night) or

whether the sleep period audio content will stop after a user defined period of time. In some embodiments, the user interface **15** may allow the user to select an option that causes the media delivery system **10** to gradually decrease the volume during the sleep period so as not to wake or disturb the user with a sudden change in volume. In other embodiments, the user interface may allow the user to select an option that causes the media delivery system **10** to gradually change the audio played from the audio content selected for the bedtime period to the audio content selected for the sleep period.

Once the user is satisfied with the sleep period settings, the user may save the sleep settings by selecting the "Save Sleep Settings" button to move on to the next step. Upon completing the sleep settings step by selecting the "Save Sleep Settings" button, the media delivery system **10** may save the bedtime settings of the user in the storage media **30** or the memory **34**. In some embodiments, the media delivery system **10** may determine whether the sleep period image content or audio content is currently stored in the storage media **30** or the memory **34**. In some embodiments, the processing unit **18** may issue a request to the server unit **22** to download the missing content if the sleep period image content or audio content is not currently stored in the storage media **30** or the memory **34**.

During the wake-up settings selection step of the sleep mode setup process, the user interface **15** is operable to allow the user to adjust if, when, and how the media delivery system **10** will wake up the user during a wake-up period, as shown in FIG. **6**. The user interface **15** may include an option for activating or deactivating the wake-up period. If the wake-up period is "OFF", the media delivery system **10** will not attempt to wake-up the user after the sleep time period expires. If the wake-up period is "ON", the media delivery system **10** will attempt to wake-up the user according to the wake-up period settings.

The user interface **15** is operable to allow the user to adjust the time that the wake-up period begins, whether the media delivery system **10** will provide audio content such as an alarm routine during the wake-up period, and what audio content may be provided. The user interface **15** is operable to allow the user to select a visual media content to display during the wake-up period, and how long the visual media content will play. The user interface **15** may also include settings allowing the user to adjust whether the audio content is provided before, after, or at the same time that the visual content begins.

The visual media content available for selection in the wake-up setting step is stored in the database **24** accessible over the network **20**, as described below. The visual media content available for play during the wake-up period may include video scenes with subtle movement, such as a sunrise over the ocean. In some embodiments, the audio content available for selection during the wake-up setting step is locally stored in the storage media **30** or the memory **34**. In other embodiments, the audio content may be stored in the database **24**. The user may upload his video media content or audio media content to the database **24**, which are made available for selection during the wake-up setting step.

The user interface **15** may also allow a user to modify the wake-up settings according to a schedule or calendar. The user interface **15** may include a weekly schedule allowing the user to select days of the week on which the media delivery system **10** will activate the wake-up period, and deselect days of the week on which the media delivery system **10** will not activate the wake-up period. A wake-up calendar feature on the user interface **15** may allow the user to select days on which the wake-up period settings are modified. For example, the user may use the wake-up calendar feature to prevent the media delivery system **10** from activating the wake-up period on a specific date or to deliver special holiday themed visual content on holiday mornings.

The wake-up calendar feature may include an option for displaying a user-defined text reminder or message on certain days, such as reminding the user of an important birthday, meeting, or other event during the wake-up period. The user-defined message may require the user to acknowledge the message before the message will disappear to ensure that the user sees the reminder.

Once the user is satisfied with the wake-up period settings, the user may save the wake-up period settings by selecting the "Save Wake-Up Settings" button. Upon completing the wake-up period settings by selecting the "Save Wake-Up Settings" button, the media delivery system **10** may save the wake-up settings of the user in the database **24** in association with a user profile including user preferences.

After setting the bedtime period settings, the sleep period settings, and the wake-up period settings, the user interface **15** may present a summary of the settings and request confirmation from the user. In some embodiments, the media delivery system **10** may wait to save the bedtime period settings or the wake-up period settings of the user in the database **24** in association with the user profile until after receiving confirmation of the settings from the user.

A method of delivering media content in association with the media delivery system **10** is described with reference to FIG. **7**. In particular, the method of delivering media content is described with reference to executing a cycle of the sleep mode according to the bedtime period settings, the sleep period settings, and the wake-up period settings defined by the user. When the application **26** determines that it is time to execute the cycle of the sleep mode based on a preset time or a user request, the application causes the processing unit **18** to communicate with the server unit **22**. In step S**1**, the application **26** sends, to the server unit **22**, the user identification information and a request to access the sleep mode media content. In particular, the application **26** may send a sleep mode media content request requesting the server unit **22** to retrieve the bedtime media content, the sleep period media content, and the wake-up media content not stored in the storage media **30** or the memory **34**. In step S**2**, the server unit **22** sends a request to the database **24** to send media data corresponding to the sleep mode media content requested and user preferences associated with the user identification information. In step S**3**, the database **24** sends the requested media data to the server unit **22**. The server unit **22** then begins streaming the requested bedtime media content data to the processing unit **18** in step S**4**. The processing unit **18** processes the bedtime media content data received and sends the processed bedtime media content to be played on the display device **12**. The server unit **22** may continue to stream the bedtime media content data to the processing unit **18** until the bedtime time period specified in the bedtime settings is achieved. Once the bedtime time period is achieved, the server unit **22** stops streaming the bedtime media content in step S**5** and the application **26** begins to transition to the sleep period.

In step S**6**, the processing unit **18** plays locally saved sleep period media content on the display device **12**. The sleep period media content may be saved on the memory **34** or the storage media **30** prior to the cycle of the sleep mode. In some embodiments, however, sleep period media content data is locally cached media content that is downloaded after

the cycle of the sleep mode is initiated. The sleep period media content data may be downloaded along with the streaming of the bedtime media content data in step S4 when the bandwidth of the network **20** is sufficient. Alternatively, the processing unit **18** may execute a process of piecewise downloading the sleep period media content data after step S4 begins, as described below with reference to FIG. **8**. The processing unit **18** causes the display device **12** to play the sleep period media content during the entire desired sleep period duration. Once the desired sleep period duration is achieved, the processing unit **18** causes the display device **12** to stop playing the sleep period media content in step S7.

In step S8, the application **26** causes the processing unit **18** to send, to the server unit **22**, the user identification information and a request to stream the wake-up media content. In step S9, the server unit **22** then begins streaming the requested wake-up media content data to the processing unit **18**. The processing unit **18** processes the wake-up media content data received and sends the processed wake-up media content to be played on the display device **12**. The server unit **22** may continue to stream the wake-up media content data to the processing unit **18** until the wake-up period specified in the user preferences expires or until the processing unit **18** sends a request to stop streaming the wake-up media content data according to the wake-up settings.

The processing unit **18** may cause the display device **12** to play the wake-up period audio content, such as the selected alarm routine, and to display a message prompting the user to respond to the audio content until the user signals that he is awake via the input device **19**. The processing unit **18** will cause the display device **12** to display the selected visual media content for the wake-up period according to the wake-up settings. For example, the processing unit **18** will continue to receive streaming visual media content data from the server unit **22** until the specified duration for displaying the wake-up period visual media content is achieved. In the example shown in FIG. **6**, the processing unit **18** will receive the visual media content for 6 minutes after the user turns the alarm routine off via the input device **19**. In other embodiments, an alarm routine may associate particular visual media content with alarm audio content (i.e., alarm sound). For example, a rooster alarm routine may include visual media content of a rooster crowing accompanied by audio media content of the rooster crowing. The rooster visual media content or the rooster audio media content may gradually increase in volume or intensity to promote the user to awake. Once the user operated the input device **19** to indicate that the user is awake, the server unit **22** may begin streaming additional wake-up media content for presentation on the display device **12** according to the wake-up settings. For example, the server unit **22** may stream visual media content along with a reminder message specified in the wake-up calendar. After the processing unit **18** stops receiving the streamed wake-up period media content, the cycle of the sleep mode has ended.

A method for downloading and playing temporarily cached media content is shown in FIG. **8**. In some instances, media content is not stored on the memory **34** or the storage media **30**, or streamed from the server unit **22**. In steps S6 to S7 of the media delivery method shown in FIG. **7**, the processing unit **18** attempts to play locally stored sleep period media content from the memory **34** or the storage media **30** instead of streaming the media content from the server unit **22**. When the sleep period media content is not available on local storage, the processing unit **18** will request to download the media content from the server unit **22**. However, a seamless transition from the bedtime period to the sleep time period is desirable so as not to disturb the user's sleep. A goal of the method shown in FIG. **8** is therefore to minimize or eliminate the gap between playing the streaming media content and playing the local media content.

The media delivery system **10** may initiate the method for downloading and playing temporarily cached media content shown in FIG. **8** during the media streaming of step S4, for example. In a preliminary step, the processing unit **18** may search the memory **34** or the storage media **30** to determine whether the sleep period media content, such as the audio content, is locally stored. If the processing unit **18** determines that the sleep period media content is not available in local storage, the processing unit **18** sends a request to download a media content section of the sleep period media content from the server unit **22** in step S10. The media content section requested is a section of the complete sleep period media content, such as a short, continuous section of an audio file or a moving image file. The media content section has a smaller size than the complete sleep period media content and is therefore more quickly transferred from the server unit **22** to the processing unit **18**. The processing unit **18** may send the request to download the media content section during the streaming in step S4 or thereafter.

In step S11, the server unit **22** sends the media content section data to the processing unit **18**. In step S12, the processing unit **18** receives and processes the media content section data and causes the display device **12** to play the media content section. The processing unit **18** may cause the display device **12** to loop the media content section while the processing unit **18** obtains the rest of the sleep period media content in steps S13 to S15. For example, if the audio content is an audio file comprising a soundtrack of crickets chirping, the media content section may include one or more cricket chirps that the processing unit **18** causes the display device **12** to repeatedly play while the remainder of the audio content is obtained.

In step S13, the processing unit **18** may send a request to the server unit **22** requesting the remainder of the sleep period media content data. In step S14, the server unit **22** sends the remainder of the sleep period media content data to the processing unit **18**. In step S16, the processing unit **18** may receive and process the remainder of the sleep period media content data and merge the remainder of the sleep period media content data with the media content section data obtained in step S11 to obtain a complete version of the sleep period media content. While the processing unit **18** is downloading or processing the remainder of the sleep period media content data, the processing unit **18** may cause the display device **12** to continually play the media content section. Once the processing unit **18** obtains and processes the complete version of the sleep period media content, the processing unit may the cause the display device **12** to play the complete version of the sleep period media content for the remaining sleep period duration.

In some embodiments, in step S13, the processing unit **18** may send a request to the server unit **22** requesting the entire, complete version of the sleep period media content instead of the remainder thereof. Then, the server unit **22** may send data including the complete sleep period media content data to the processing unit **18** in step S14. In step S16, the processing unit may download and process the complete sleep period media content data. While the processing unit **18** is downloading or processing the complete sleep period media content data, the processing unit **18** may cause the

display device **12** to continually play the media content section. Once the processing unit **18** obtains the complete version of the sleep period media content, the processing unit may the cause the display device **12** to play the complete version of the sleep period media content for the remaining sleep period duration.

In some embodiments, the method of downloading and playing temporarily cached media content may be a recursive process in which the media content section is repeatedly augmented until the complete version of the sleep period media content is obtained. After obtaining an initial media content section data in step S**12**, the processing unit **18** may, in step S**13**, send a request to the server unit **22** to transmit a second media content section that is a different section of the complete sleep period media content than the media content section transmitted in step S**11**. In step S**14**, the server unit **22** may send the second media content section to the processing unit **18** for download. In step S**15**, the processing unit **18** may return to step S**12** to obtain an additional media content section if the processing unit **18** has not obtained all media content sections from the server unit **22**. The processing unit **18** may process the second media content section data obtained in step S**14** and merge the second media content section data with the initial media content section data to obtain a larger media content section.

Returning to step S**12**, the processing unit **18** may cause the display device **12** to play the larger media content section if the initial media content section data and second media content section data are successfully merged. Otherwise, the processing unit **18** may cause the display device **12** to continue playing the initial media content section. In step S**13**, the processing unit **18** sends a request to the server unit **22** requesting the additional media content section. In step S**14**, the server unit **22** may send the additional media content data to the processing unit **18** for download. In step S**15**, the processing unit **18** may again return to step S**12** to obtain an additional media content section if the processing unit **18** has not obtained all of the media content sections comprising the complete media content from the server unit **22**. Steps S**12** through S**15** may be repeated until the processing unit **18** obtains all of the media content sections from the server unit **22**. In step S**16**, the processing unit **18** may process any unprocessed media content sections, and merge all the media content sections to obtain the complete sleep period media content. Once the processing unit **18** obtains the complete version of the sleep period media content, the processing unit may cause the display device **12** to play the complete version of the sleep period media content for the remaining sleep period duration.

The method of delivering media content and method for downloading and playing temporarily cached media content described above overcome disadvantages of lapse in video and expense associated with streaming media content.

Although the media delivery system **10** is described with reference to the sleep mode of the application **26**, the above-described features may also be executed in other modes. For example, the ambiance mode may be provided that streams media content during a first period over the network **20**, plays a locally saved picture slideshow accompanied by locally saved music stored on the memory **34** during a second period, then resumes streaming media content over the network **20** during a third period. The ambiance mode may automatically create ambiance during a family gathering on Christmas, for example, by streaming holiday themed songs and visual media content with family pictures stored on a local storage device.

The media delivery system **10** may be accessible on an internet website or the application. For example, the user may access, edit, and upload user preferences and user-defined content for the media delivery system **10** using an internet browser or a mobile device application configured to execute on a mobile device. When accessing the media delivery system **10** using the internet browser or the mobile device application, the user may upload personal media content to the server unit **22** (see FIG. **9**). The personal media content may be a video or audio content recorded by the user or otherwise stored on a local device, such as a favorite TV show episode, by way of non-limiting example. The uploaded media content may be streamed to the processing unit **18** from the server **22** using the application **26**. The uploaded media content may be available at a location other than the user's home using the application **26**. Advantageously, the user may then experience a familiar sleep mode cycle when sleeping in a hotel, for example.

The media schedule mode of the application **26** may allow a user to completely customize the media content provided via the media delivery system **10** at a specific day or time according to a scheduling module shown in FIG. **9**. The media schedule mode may run in the background and control the media content delivered by the media delivery system **10** when another mode is not actively engaged. The user may select specific media content to be streamed or played at a scheduled time or date.

In FIG. **9**, the media schedule mode is accessed to schedule media content that will be played on a certain date ("Jun. 16, 2017" as shown). For example, from 9 AM to 12 PM on the certain date, the media delivery system **10** will cause the server unit **22** to stream media content "Gardening Pt. 3" to the processing unit **18** for display on the display device **12**. At 12:00 PM, the server unit **22** will stop streaming "Gardening Pt. 3" and begin streaming different media content data for displaying a message "Lunch Time" over a locally saved image "Flowers.jpg" while streaming audio content "Four Seasons". From 1:00 PM to 2:00 PM, the server unit **22** streams video media content "Mountain-top View" and audio content "Birds Chirping" for presentation on the display device **12**.

The media delivery system **10** allows a user to completely control the media content presented at a specific time or on a specific date. The user may control the media content presented on an elderly relative's media delivery system **10** to help prevent the elderly relative from becoming frustrated with operation of the display device **12**. The user may also send daily reminders to the elderly relative regarding daily medication or important appointments. The media delivery system **10** may also allow the user to control the media content that a child views by setting a daily schedule. The user may also cause the media delivery system **10** to deliver media content containing a special message to a child or loved one on a certain day, such as a birthday or anniversary. The media delivery system **10** may allow the user to deliver a video message, such as a good morning greeting or reading a bedtime story, to a child at a specific time when the user is away. Those of ordinary skill in the art will appreciate that these advantages and implementations are non-limiting and illustrative of the myriad ways in which the media delivery system **10** may be implemented to overcome the deficiencies of previous media systems.

Various embodiments of the invention are described above in the detailed description. While these descriptions directly describe the above embodiments, it is understood that those skilled in the art may conceive modifications and/or variations to the specific embodiments shown and

described herein. Any such modifications or variations that fall within the purview of this description are intended to be included therein as well. Unless specifically noted, it is the intention of the inventor that the words and phrases in the specification and claims be given the ordinary and accustomed meanings to those of ordinary skill in the applicable art(s).

The foregoing description of various embodiments of the invention known to the applicant at the time of filing the application has been presented and is intended for the purposes of illustration and description. The present description is not intended to be exhaustive nor limit the invention to the precise form disclosed and many modifications and variations are possible in the light of the above teachings. The embodiments described serve to explain the principles of the invention and its practical application and to enable others skilled in the art to utilize the invention in various embodiments and with various modifications as are suited to the particular use contemplated. Therefore, it is intended that the invention not be limited to the particular embodiments disclosed for carrying out the invention.

While particular embodiments of the present invention have been shown and described, it will be obvious to those skilled in the art that, based upon the teachings herein, changes and modifications may be made without departing from this invention and its broader aspects and, therefore, the appended claims are to encompass within their scope all such changes and modifications as are within the true spirit and scope of this invention. It will be understood by those within the art that, in general, terms used herein are generally intended as "open" terms (e.g., the term "including" should be interpreted as "including but not limited to," the term "having" should be interpreted as "having at least," the term "includes" should be interpreted as "includes but is not limited to," etc.).

What is claimed is:

1. A media delivery system for delivering media content to a user at predetermined times, the media delivery system comprising:

a processing unit electronically coupled to a first communication interface that is configured to communicate over a network;

a computer-readable storage medium storing a programming module configured to be executed on the processing unit;

a display device electronically coupled to the processing unit;

a media storage unit electronically coupled to the processing unit; and

the programming module being configured to cause the processing unit to:

receive a user instruction including a first media selection of a first media content stored on the network, a first time setting, a second media selection of a second media content, a second time setting, a third media selection of a third media content stored on the network, and a third time setting,

send a request to a remote server unit over the network requesting the server unit to stream the first media content over the network beginning at a first time corresponding to the first time setting, cease streaming the first media content at a second time corresponding to the second time setting, and to stream the third media content over the network beginning at a third time corresponding to the third time setting,

receive the first media content streamed over the network beginning at the first time,

play the first media content on the display device beginning at the first time and ceasing at the second time,

play the second media content on the display device beginning at the second time by:

determining, before the second time, whether the second media content is stored on the media storage unit,

sending, in response to determining that the second media content is not stored on the media storage unit, a request to transmit a second media content section that is an executable section of a complete version of the second media selection,

receiving the second media content section,

processing, at the second time, the second media content section,

sending, from the first communication interface after receiving at least part of the second media content section, a request for an additional second media content section,

receiving the additional second media content section, and

processing the additional second media content section,

cease playing the second media content at the third time,

receive the third media content over the network beginning at the third time, and

play the third media content on the display device beginning at the third time.

2. The media delivery system of claim **1**, wherein the first media content and the third media content are stored in a database on the network.

3. The media delivery system of claim **1**, wherein the media storage unit is located on a same local network as the processing unit, and the server unit is located on a different local network than the processing unit.

4. The media delivery system of claim **1**, wherein the first media selection comprises at least video content and audio content.

5. The media delivery system of claim **1**, wherein the third media selection comprises at least video content and audio content.

6. The media delivery system of claim **1**, the programming module further configured to cause the processing unit to receive the second media content section during streaming the first media content.

7. The media delivery system of claim **1**, the programming module further configured to cause the processing unit to play the second media content section two or more times on the display device.

8. The media delivery system of claim **1**, the programming module further configured to cause the processing unit to receive the additional second media content section during processing the second media content section.

9. A computer program product comprising at least one non-transitory computer-readable medium storing computer-executable code for delivering media content to a user at predetermined times, the computer-executable code causing a processing unit to perform the steps of:

processing a user instruction including a first media selection of a first media content located on a remote network, a first time setting, a second media content selection of a second media content, a second time setting, a third media selection of a third media content located on the remote network, and a third time setting;

receiving and storing, at a server location, the first media selection, the first time setting, the second time setting, and the third time setting;

streaming, at a first time corresponding to the first time setting, the first media selection over an internet connection to a local location;

ceasing streaming the first media selection at a second time corresponding to the second time setting;

processing the second media content by:

determining, before the second time, whether the second media content is stored on the local network;

sending, in response to determining that the second media content is not stored on the local network, a request to transmit a second media content section that is an executable section of a complete version of the second media selection;

receiving the second media content section;

processing, at the second time, the second media content section;

sending, after receiving at least part of the second media content section, a request to transmit an additional second media content section;

receiving the additional second media content section; and

processing the additional second media content section;

ceasing processing of the second media content at a third time corresponding to the third time setting; and

streaming, at the third time the third media content over the internet connection.

10. The computer program product of claim **9**, wherein the first media content comprises at least one of a visual content or an audio content, and streaming the first media content further comprises processing the first media content.

11. The computer program product of claim **9**, wherein the second media content includes a visual content and an audio content, and processing the second media content further comprises processing the visual content in association with the audio content.

12. The computer program product of claim **9**, wherein the receiving second media content section occurs during streaming the first media content.

13. The computer program product of claim **9**, wherein the processing the second media content section further includes causing an associated display device to play the second media content section two or more times.

14. The computer program product of claim **9**, wherein receiving the additional second media content section occurs during processing the second media content section.

15. A computer-implemented method for delivering media content to a user at predetermined times, the method comprising:

receiving a user instruction at a local location, the user instruction including a first media selection of a first media content located on a remote network, a first time setting, a second media content selection of a second media content, a second time setting, a third media selection of a third media content located on the remote network, and a third time setting;

receiving and storing, at a server location, the first media selection, the first time setting, the second time setting, and the third time setting;

streaming, at a first time corresponding to the first time setting, the first media selection over an internet connection to a local location;

ceasing streaming the first media selection at a second time corresponding to the second time setting;

processing the second media content by:

determining, before the second time, whether the second media content is stored on the local network;

sending, in response to determining that the second media content is not stored on the local network, a request to transmit a second media content section that is an executable section of a complete version of the second media selection;

receiving the second media content section;

processing, at the second time, the second media content section;

sending, after receiving at least part of the second media content section, a request to transmit an additional second media content section;

receiving the additional second media content section; and

processing the additional second media content section;

ceasing processing of the second media content at a third time corresponding to the third time setting; and

streaming, at the third time the third media content over the internet connection.

16. The computer-implemented method of claim **15**, wherein the first media content comprises at least one of a visual content or an audio content, and streaming the first media content further comprises processing the first media content.

17. The computer-implemented method of claim **15**, wherein the second media content includes a visual content and an audio content, and processing the second media content section further comprises processing the visual content in association with the audio content.

18. The computer-implemented method of claim **15**, wherein the receiving second media content section occurs during streaming the first media content.

19. The computer-implemented method of claim **15**, wherein the processing the second media content section further includes causing an associated display device to play the second media content section two or more times.

20. The computer-implemented method of claim **15**, wherein receiving the additional second media content section occurs during processing the second media content section.

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